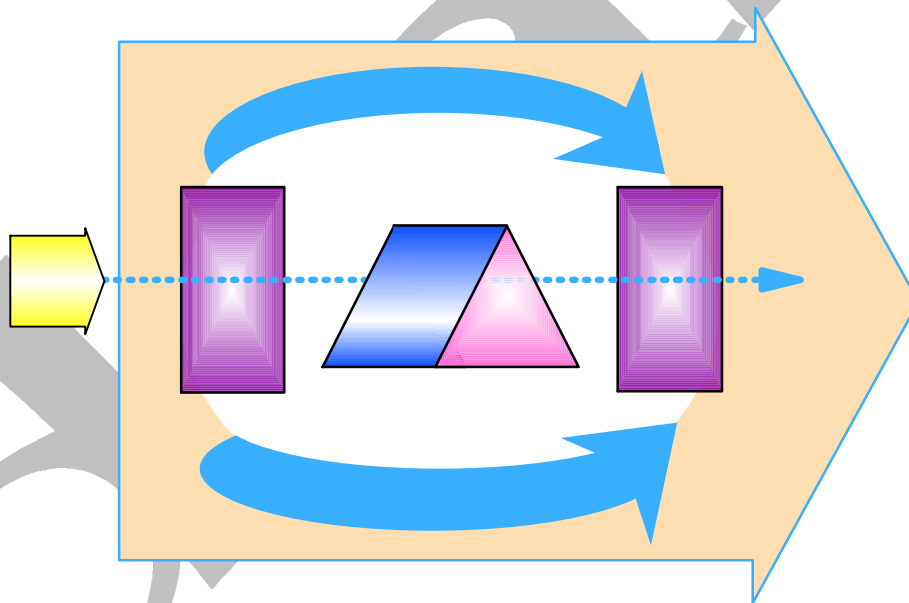


Federal Enterprise Architecture Conceptual Framework



**Developed by: The Federal Conceptual Model Subgroup
for
The CIO Council**

August 1998

FEDERAL ENTERPRISE ARCHITECTURE CONCEPTUAL FRAMEWORK

TABLE OF CONTENTS

	PAGE
INTRODUCTION	1
ARCHITECTURE QUESTIONS	3
WHAT IS A FEDERAL ENTERPRISE ARCHITECTURE?	3
WHY DEVELOP A FEDERAL ENTERPRISE ARCHITECTURE?	3
WHAT ARE THE RETURNS, RISK, AND COSTS OF DEVELOPING A FEDERAL ENTERPRISE ARCHITECTURE?	4
WHAT IS THE FEDERAL ENTERPRISE ARCHITECTURE CONCEPTUAL FRAMEWORK?	7
HOW WILL FEDERAL ORGANIZATIONS BE IMPACTED BY THE CONCEPTUAL FRAMEWORK?	8
OVERVIEW OF THE CONCEPTUAL FRAMEWORK	10
LEVEL I	10
LEVEL II	11
LEVEL III	13
REALIZATION OF THE MODEL	15
RECOMMENDATIONS TO THE CIO	15
RECOMMENDATIONS TO FEDERAL AGENCIES	17
APPENDIXES	
APPENDIX A - ARCHITECTURE TERMS AND DEFINITIONS	A-1
APPENDIX B - SUBGROUP PARTICIPANTS	B-1

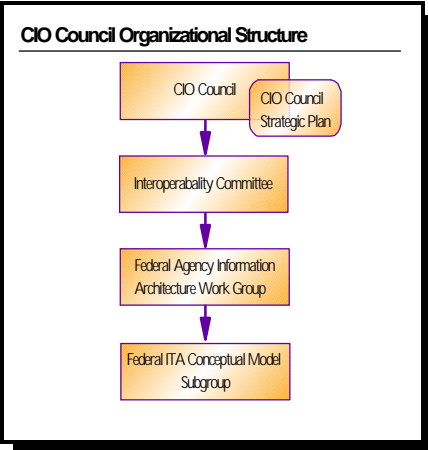
INTRODUCTION

In April of 1998, the Federal Conceptual Model Subgroup was formed for the primary purpose of developing a Federal Enterprise Architecture Conceptual Framework, in response to the CIO Council Strategic Plan, January 1998.

Traditional architecture efforts require a substantial initial investment in time and dollars. First, the current baseline must be captured, and then a target architecture must be developed. Only after these efforts are completed, is it possible to begin to implement needed architecture changes. Yet, today, many initiatives are underway for implementing new Federal architectures. These initiatives are important for supporting Federal business needs and cannot be stalled pending the development of a current Federal architecture and a target Federal architecture.

Experts in the field of architecture note that only 20% of an enterprise architecture is strategically valuable. This means that 80% of this large effort yields little reward. To achieve the greatest return from an architecture effort, it is important to target the worthwhile 20% of architecture activities. These tend to be today's architecture initiatives. The challenge for a successful Federal architecture is to allow, indeed encourage, the development of an initiative, while providing an organizational framework for integrating the initiatives into a cohesive, holistic picture.

The goal of the Subgroup was to develop a simple high level framework, consisting of modular diagrams and definitions, for communicating the overall organization and relationships of *all* architecture components required for developing and maintaining a Federal architecture. The diagrams must be modular and allow for decomposition into more detailed levels. The framework must be flexible to easily allow for the addition of new activities which may arise over time, and to allow for easy integration of existing agency architectures. Additionally, and most importantly, the model must focus on *common* Federal architecture activities, must address the realities of the Federal workplace, must not be overly burdensome to populate, and must provide for needed immediate successes.



An **enterprise architecture** is a strategic information asset base which defines the *business*, the *information* necessary to operate the business, the *technologies* necessary to support the business operations, and the *transitional processes* necessary for implementing new technologies in response to the changing needs of business.

The Subgroup used the July 1997 OMB Guidance. Considering the model diagram as *one* component of the Federal Enterprise Architecture Conceptual Framework, the Subgroup did two things: identified seven additional components needed for developing and maintaining a Federal architecture, and drilled down a level from the model to achieve a further granularity of detail.

What is the value of a Federal architecture?

- Promote Federal Interoperability
- Promote Agency Resource Sharing
- Provide potential for Federal and Agency Reduced Costs
- Improve ability to Share Information
- Support Federal and Agency Capital Acquisition Planning

The result of this three month effort is this draft conceptual framework, including diagrams, defined in this document. It is important to understand that this effort does not attempt to define the Federal architecture content. Rather, this effort defines an organizational framework and place-holder for architecture activities, for *future* population of Federal architecture information.

The value of this Federal Enterprise Architecture Conceptual Framework is that it provides a mechanism for linking Agency architecture activities with Federal architecture activities, and promotes the development of quick successes within an overall Federal architecture plan. This link allows Agency's to work Agency architecture issues within the broader context of the Federal architecture, and to reap the benefits of resource sharing, interoperability with other Agency's, and other benefits (see text box above). Additionally, by allowing for quick successes, the model addresses the real world business needs of today's initiatives which provide strategic value, the 20% of all architecture efforts.

For the purposes of this document, the Federal Enterprise Architecture Conceptual Framework consists of three levels. The model is flexible enough to allow for additional decomposition. It is expected that as new activities are identified, they can be plugged into the appropriate component and decomposed as necessary.

ARCHITECTURE QUESTIONS

The following questions are intended to help the reader better understand the purpose of a Federal enterprise architecture, and how the Federal Enterprise Conceptual Framework will help the Federal Government achieve a Federal enterprise architecture. These are the questions:

1. What is a Federal enterprise architecture?
2. Why develop a Federal enterprise architecture?
3. What are the returns, risks, and costs, for developing a Federal enterprise architecture?
4. What is the Federal Enterprise Architecture Conceptual Framework?
5. How will Federal organizations be impacted by the conceptual framework?

1. What is a Federal enterprise architecture?

A Federal **enterprise architecture** is a strategic information asset base which defines the *business*, the *information* necessary to operate the business, the *technologies* necessary to support the business operations, and the *transitional processes* for implementing new technologies in response to the changing needs of the business. Stated differently, the Federal enterprise architecture, is a strategic asset repository, which consists of models that define the current and target architecture environments, and the transitional processes for evolving from the current to the target. The focus of a Federal enterprise architecture is limited to *common Federal architecture issues*.

Federal Enterprise: includes Federal organizations of the Federal Government and all partners.

Federal Organizations: refers to Tier 1 and Tier 2 organizations of the Federal Government, such as Agencies, Bureaus, and Departments.

Common Federal Architecture Issues: issues which will benefit Federal organizations and the public if resolved at the Federal level.

2. Why develop a Federal enterprise architecture?

If the Federal Government wants to be able to:

- organize Federal information on a Federal-wide scale,
- share this information between Federal organizations,
- help Federal organizations develop their architectures, and
- help Federal organizations move faster toward the development their IT investment processes,

then a Federal-wide collaboration tool is needed to collect common Federal architecture information, along with a repository for storing the Federal architecture information. A Federal Enterprise Architecture Conceptual Framework is such a tool and repository.

As mandated through the Clinger-Cohen Act of 1996, Federal organizations are required to develop and maintain an enterprise architecture. This is a large, complex, and resource intensive effort. By collaborating, Federal organizations can share staff and budget resources, and lessen their respective burdens, towards this effort. Collaboration can also encourage the development of interoperability standards, which in turn, can promote Federal-wide information sharing. Collaboration can also help evolve a better understanding of common Federal processes, information, and other areas where economies of scale might be applied.

Increasingly, Federal organizations are finding that the development of their architectures is on the critical path for development of their IT investment planning processes. Helping Federal organizations develop their architectures will also help Federal organizations progress towards completing their IT investment planning processes.

The following questions expands further the value of a Federal enterprise architecture.

3. What are the *returns*, *risks*, and *costs*, for developing a Federal enterprise architecture?

3.1 What are the *returns*?

Better Information

- **Mission Alignment** - A Federal enterprise architecture has a strategic planning component for the purpose of ensuring strategic alignment with a Federal vision.
- **Cross-Agency Business Needs** - A Federal enterprise architecture promotes the sharing of information throughout the Federal enterprise, across Federal organizations.
- **Re-invention Initiatives** - A Federal enterprise architecture defines common Federal business needs, and defines the common business processes required to support these needs. These common processes can then be used to support Federal re-invention initiatives.
- **Data Collection and Data Quality** - A Federal enterprise architecture defines a consistent method for collecting data, which can in turn help the Federal Government improve data quality, and reduce the data collection burden for partners.

- **Public Access** - A Federal enterprise architecture promotes a consistent method for organizing and categorizing Federal architecture information, resulting in a consistent way of presenting Federal information to external partners and the public through the Internet.

Facilitated Decision Making

- **IT Capital Investment Planning** - A Federal enterprise architecture defines a target direction for future IT acquisitions. This information facilitates Federal capital investment decision making.
- **Faster Response to Changing Business Needs** - A Federal enterprise architecture has readily available information (blueprints) on the current IT environment. With this information at hand, Federal decision making can progress faster, because lengthy fact gathering steps are minimized, and integrated solutions are easier to visualize.
- **Gap Analysis** - The enterprise architecture blueprints, readily highlight areas of overlooked or missing information, which translate into Federal opportunities for IT solutions.
- **Knowledge Base** - The existence of a Federal enterprise architecture organizational structure and framework provides the Federal Government with a ready available pool of knowledgeable IT resources for quick and informed IT decision making.

Potential Cost Reduction

- **Economies of Scale** - A Federal enterprise architecture identifies common Federal activities across Federal organizations, highlighting potential areas for cost savings.
- **Resource Sharing** - A Federal enterprise architecture highlights common Federal areas for potential resource sharing of Federal IT staff resources, and IT technical resources.
- **Market Research** - A Federal enterprise architecture effort requires constant monitoring of emerging technologies for enterprise-wide use. This research can be shared with Federal organizations, thereby relieving them of the added burden and cost of collecting and evaluating this information themselves.

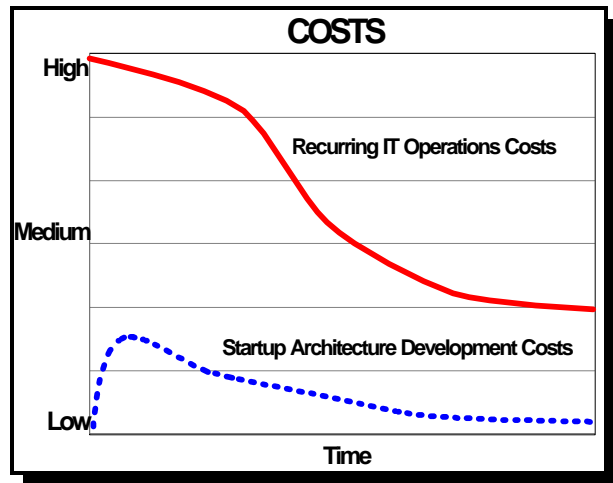
3.2 What are the *risks*?

Architecture Approach - The Federal Government risks allocating *too much* time and resources to an enterprise architecture effort, thereby yielding potentially little return at great cost. An enterprise architecture effort is a continuing process requiring a large investment in time and effort. Yet, research indicates that only 20% of an enterprise architecture is strategically valuable, which means the remaining 80% yields little reward. In order to mitigate this risk, the Federal Government must capitalize on the rewarding 20%.

3.3 What are the *costs*?

Start-up Architecture Development

Costs - Start-up costs for developing a Federal enterprise architecture effort can be significant because substantial effort is required to define and understand the current architecture environment, and to institutionalize an organizational framework for research and decision making. The Federal Government has no current architecture information at this time and would need to develop this information, incrementally, from scratch. Neither does the Federal Government have an organizational framework for research and decision making. This, too, would need to be institutionalized.



Recurring IT Operations Costs - Case studies in industry show that over time, recurring operations costs should decrease as more of the current enterprise architecture is captured, and more of the target enterprise architecture is defined and implemented. With good architectural information, the Federal Government can realize cost savings from better informed decision making, and from the economies of scale that come from good architectural design.

Opportunity Costs - By deploying staff and resources to the development of a Federal enterprise architecture, Federal organizations, forego other investment opportunities. Staff and resources used for Federal enterprise architecture development and maintenance are not available for other activities.

3.4 What are the *risks* and *costs* of not developing a Federal enterprise architecture?

Without a Federal enterprise architecture to guide system modernization efforts, there is no systematic way to preclude, either inconsistent system design and development decisions, or the resulting sub-optimal performance and added cost associated with incompatible systems. The resulting impact to the Federal Government is inability to share information, incomplete information, and slow response to change.

Inability to Share Information - Without Federal standards and guidelines, Federal organizations will continue to experience difficulties in sharing business information through technology mediums such as word processing documents, emails, databases, and other system applications.

Incomplete Information - At present, the Federal Government does not have a Federal enterprise architecture. This lack results in incomplete information for decision making:

- Federal cross-agency business information is incomplete, due to existing independent stove-pipe systems which cannot easily share information.
- Federal IT capital planning investment information is incomplete, due to the lack of information on Federal current architecture environment, lack of ongoing IT market research, and lack of a Federal target architecture.

Without a Federal enterprise architecture to support business and technology decision making, the Federal Government faces an increasing risk of making inappropriate and costly decisions, because of incomplete information.

Slow Response to Change - Without a Federal enterprise architecture, the Federal Government will continue to be slow to respond to change stimulus. For example, the Y2K activity would have benefitted greatly, from having a Federal enterprise architecture, in the following ways:

- Faster identification of impacted areas of the Federal enterprise architecture through evaluation of current architecture information,
- Faster containment of the problem, by using the Federal enterprise architecture decision making body to quickly define data standards for implementation, from this point forward, and
- Faster mobilization into action through an existing and educated Federal enterprise architecture decision-making infrastructure.

4. What is the Federal Enterprise Architecture Conceptual Framework?

A Federal enterprise architecture conceptual model is an *organizing mechanism* for managing the development, maintenance, and facilitated decision making of a Federal enterprise architecture. The Federal Enterprise Architecture Conceptual Framework provides a *structure* for organizing Federal resources, and for defining and managing Federal enterprise architecture activities.

The development and maintenance of an architecture is a *continuing process* of evaluating current conditions and seeking target solutions. The conceptual model articulates *how* the enterprise architecture will be developed and maintained. Note that a conceptual model does not contain architecture *content*, but rather, is a *holding place* for the content once developed.

In arriving at the Federal Enterprise Architecture Conceptual Framework, the Conceptual Model Subgroup of the Interoperability Committee evaluated three approaches:

- the *conventional approach* which promotes the initial development of a full blown architecture before changes can be applied,
- the *segment approach* which promotes the incremental development of architecture segments within a structured enterprise architecture framework, and
- the *status quo approach* which represents business as usual.

In order to mitigate the risk of over spending for little return, and in order to curtail startup costs for a full blown architecture, and to realize returns quickly, the subgroup selected the segment approach, which forms the basis for the Federal Enterprise Architecture Conceptual Framework.

5. How will Federal organizations be impacted by the conceptual framework?

The intent of this Federal model is to provide an organizing framework and collection of terms, by which Federal organizations, can link their respective architectures to a Federal enterprise architecture. The Conceptual Model Subgroup approached the development of this model with sensitivity towards burdening Federal organizations with restrictions, especially those organizations with existing architectures. Indeed, the subgroup consisted of representatives from many such organizations, whose contributions included protecting the interests of architecture efforts in their respective organizations. As a result, the group agreed early on to use the widely accepted OMB model as a foundation, and to expand the foundation to meet the organizational and management needs of a Federal architecture, rather than introduce a new and potentially burdensome design. The subgroup feels that the resulting model, the Federal Enterprise Architecture Conceptual Framework, is a flexible tool which will enhance rather than hinder the architecture efforts of individual Federal organizations.

The Federal model is expected to help Federal organizations develop and maintain architectures by providing:

- an enterprise architecture template,
- terms for communication,
- a repository structure,
- an organizing mechanism for collaboration, and
- support towards IT investment planning.

An Enterprise Architecture Template - The model represents an “enterprise” architecture, which for Federal purposes, defines the “enterprise” as the Federal Government. Federal organizations can use the same enterprise model to more narrowly define the “enterprise” as their own organization, and then use the model to respond to the Clinger-Cohen Act, which requires them to develop an enterprise architecture for their organization. These Federal organizations can choose to use the model as is, or can modify it to meet individual needs. In either case, the model helps jumpstart the

architecture development efforts of Federal organizations.

Terms for Communication - Developing an enterprise architecture is a complex undertaking, further complicated by the lack of consistent terms for communication. Federal organizations who have started architecture development efforts have quickly recognized the need for a common set of terms. Architecture terminology is used in different ways with widely varying meanings. The model clarifies vague terms, and standardizes the meanings of varying terms as they relate specifically to a Federal architecture, but at the same time, can also be used by Federal organizations to describe their enterprise architecture. As such, the model serves as a Federal-wide tool set for communicating architecture concepts and issues, which can be used by Federal organizations, thus minimizing the need for these organizations to develop their own set.

Asset Management Tool - The framework can be used to develop and maintain Federal strategic information assets, which are the architecture plans, or blueprints, of the enterprise current and target architectures. As these assets are developed incrementally through architecture segments, they are added to the Federal asset base. As the asset base grows over time it becomes increasingly valuable and yields steadily higher returns (see the discussion on returns, earlier in this document). A quality architecture will have a consistent way of developing these assets, and a consistent way of making the asset information available. To use this framework effectively, the CIO Council should develop the architecture *models* necessary for consistent asset development, and a *repository* for organizing, storing, and presenting the assets.

An Organizing Mechanism for Collaboration - The model is an organizing framework which can be used to support the architecture processes and activities of Federal organizations. The model supports incremental development of architecture segments, which in turn supports collaboration for the purpose of developing these segments. Collaboration can occur *between* Federal organizations, as well as *within* Federal organizations. Federal organizations can benefit from peer collaboration through resource sharing. Hefty staff and budget resources are required to develop and maintain an enterprise architecture. Through collaboration, Agencies can share knowledge, services, and make use of economies of scale.

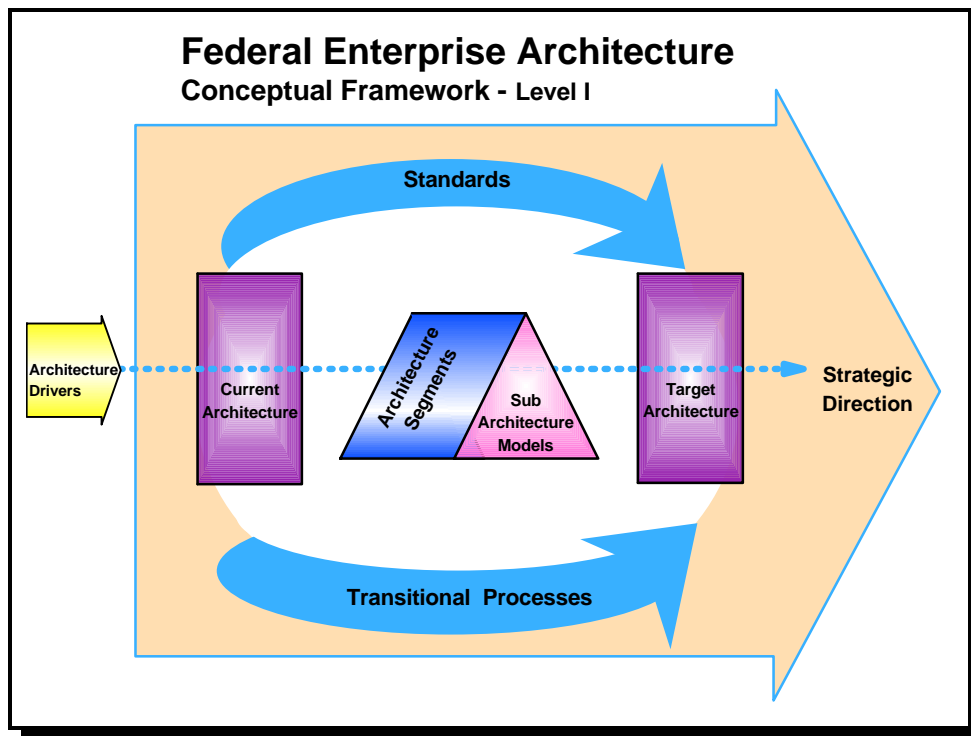
Support towards IT Investment Planning - In conclusion, the model can help Agencies quickly complete the first step towards developing their architecture, and because Agency architectures are on the critical path for IT investments planning, the model also can help Agencies move faster towards developing their IT investment processes.

OVERVIEW OF THE CONCEPTUAL FRAMEWORK

This section of the document provides an overview of the three levels of the Federal Enterprise Architecture Conceptual Framework. Definitions of the components, at each level, and further details, are provided in [Appendix A - Architecture Terms and Definitions](#).

The value of the Federal Enterprise Architecture Conceptual Framework lies in the concept of *architecture segments*. If the Federal Government were to use a conventional architecture methodology, it would have to halt all current in-progress architecture initiatives to first, develop Federal-wide current and target architectures, before it could address today's urgent business needs. Obviously, this paradigm is unrealistic and does not meet Federal business needs. The solution, therefore, is a conceptual framework which supports immediate response to urgent business needs. The Federal Enterprise Architecture Conceptual Framework allows critical parts of the architecture, called *architecture segments*, to be developed individually, while also providing a mechanism for integrating the architecture segments into the larger enterprise architecture.

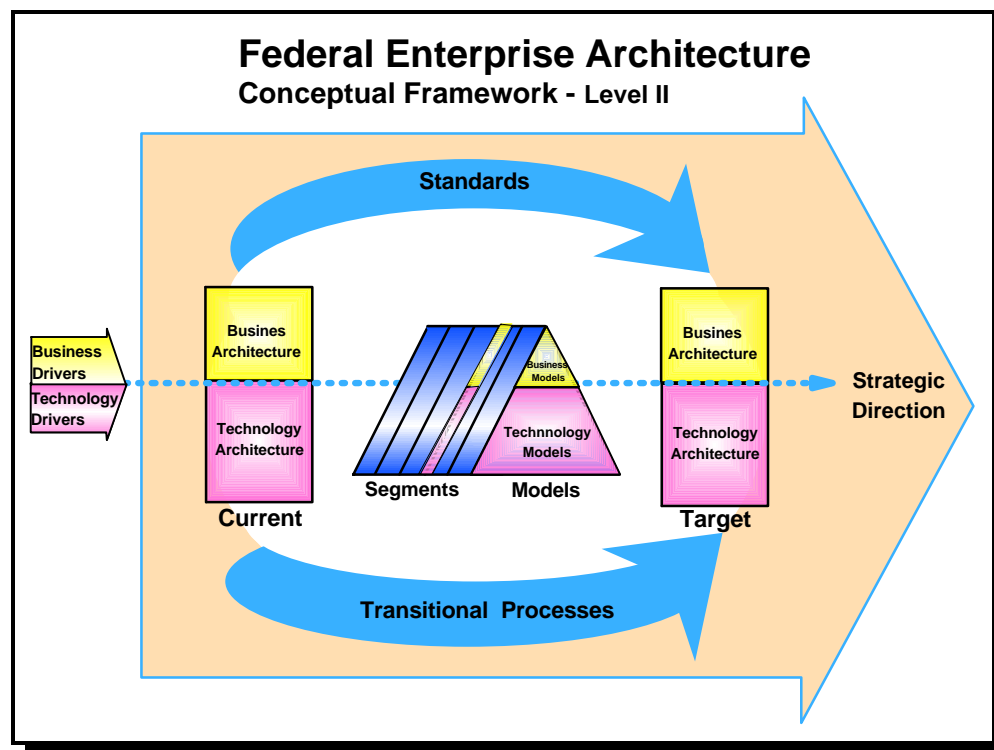
Level I is the highest level of the Federal Enterprise Architecture Conceptual Framework. It consists of eight components. Seven of the components are internal to the conceptual framework, and the eighth is external. The flow of the conceptual framework is from left to right and represents the continuous motion inherent in an enterprise architecture.



T h e

external component, called the *architecture drivers*, represents an external stimulus which causes the enterprise architecture to change. The *strategic direction* ensures that the changes align with the overall Federal direction. The *target architecture* represents a desired future state for the enterprise, within the context of the strategic direction. The *current architecture* represents the current state of the enterprise. The *transitional processes* apply the changes from the current architecture, to the target architecture, in compliance with the *architecture standards*. The *architecture segments* focus on a subset of the total changes. The *sub-architecture models* guide the engineering of the changes.

Level II shows the business and technology pieces of the enterprise architecture, and how they are related. Viewed horizontally, the top half of the framework deals with the business of the enterprise, while the bottom half deals with the technologies used to support the business. The relationship of business and technology is a push/pull relationship where the business pushes technology and technology pulls business to new levels of service delivery in support of business operations.¹



¹ A good example of a technology driver pulling the business is the *Internet*.

The **architecture drivers** are the change agents for the enterprise architecture, and are of two types:

- *business drivers*, such as the need for public access, the Clinger-Cohen Act requiring the development of architectures, and the various re-invention activities which are redefining core Federal business needs.
- *technology drivers*, such as the Internet and its revolutionizing way of meeting Federal business needs.

The **current architecture** defines the current state, or baseline, for the enterprise, and consists of two parts:

- the *current business architecture*, which defines the current business needs being met by the current technology, and
- the *current technology architecture*, which defines the currently implemented technology used for meeting the current business needs.

The **target architecture** defines the target state for the enterprise, and consists of two parts:

- the *target business architecture*, which defines the future business needs for the enterprise to be addressed through future technologies, and
- the *target technology architecture*, which defines the future technologies to be used to meet the future business needs.

The **sub - architecture models** are used to define the current and target architectures. These models consist of:

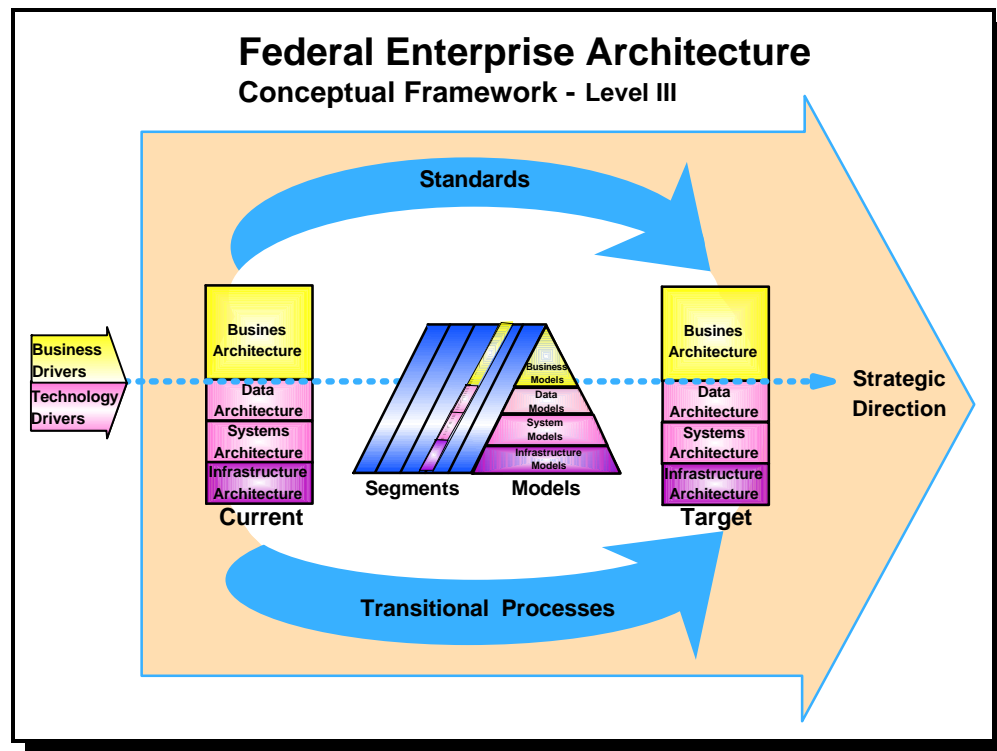
- *business models* used to model the emerging business needs prompted by business drivers, and
- *technology models* used to model the technology required to support the emerging business needs.

The **architecture segments** consist of focused architecture efforts, such as an administrative systems architecture, and represent a portion of the overall enterprise architecture. Each architecture segment is composed of a current and target architecture segment, limited in scope by the focus of the segment.

The **strategic direction** guides the development of the target Architecture, and consists of:

- a *vision* which is a statement defining the targeted end state for the architecture in five years,
- *goals & objectives* for reaching the vision, and
- *principles* for guiding the architecture development.

Level III expands the technology pieces of the framework to show the technical sub-components.



The **current technology architecture** consists of three technology sub-architectures:

- the *current data architecture*, which consists of data models,
- the *current system architecture*, which consists of system models, and
- the *current infrastructure architecture*, which consists of infrastructure models.

The **target technology architecture** consists of three technology sub-architectures:

- the *target data architecture*, which consists of data models,
- the *target system architecture*, which consists of system models, and
- the *target infrastructure architecture*, which consists of infrastructure models.

The **technology models** consists of three types of models:

- the *data models*, which are used for defining the current and target data architectures,
- the *system models*, which are used for defining the current and target system architectures, and
- the *infrastructure models*, which are used for defining the current and target infrastructure architectures.

The **technology architecture segments** consists of three technology sub-architectures:

- the *data architecture segments*, which consists of data models,

- the *system architecture segments*, which consists of system models, and
- the *infrastructure architecture segments*, which consists of infrastructure models.

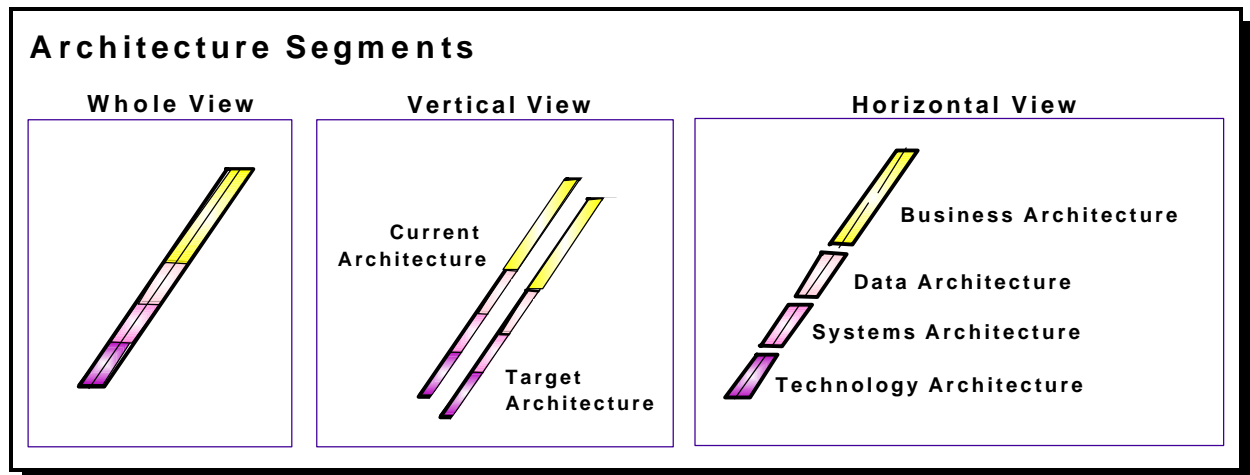
Transitional processes are any processes which support the migration from the current architecture to the target architecture. Examples include:

- *investment review*, which involves providing architecture information to support the investment review decision process,
- *segment coordination*, which entails coordinating the integration of the segment architectures into the enterprise architecture,
- *market research*, which is a periodic market scan to identify new technologies with potential benefits, and
- *asset management*, which entails managing all Federal architecture assets.

Standards refer to all mandatory standards, guidelines, and best practices, and also include profiles which are configuration options for implementing the standards. Examples include:

- *security standards*, which apply to all levels of security,
- *system standards*, which apply to application systems,
- *data standards*, and apply to data, and
- *infrastructure standards*, which apply to the infrastructure.

Each **architecture segment** contains architecture information which can be viewed vertically as current and target architecture information, or horizontally as information on the four sub-architectures (ie, business architecture, data architecture, systems architecture, and infrastructure architecture). Viewed vertically, architecture segments represent incremental parts of the enterprise architecture. Viewed horizontally, architecture segments represent incremental parts of the four sub-architectures. Each architecture segment addresses each of the sub-architectures narrowly, within the context of its scope.



REALIZATION OF THE MODEL

This section of the document contains recommendations from the Federal Conceptual Model Subgroup to the CIO Council and to Federal organizations. The subgroup feels that the following is needed from both groups, in order to institutionalize the framework and make the framework a Federal reality.

Recommendations to the CIO Council

Endorse the Framework - As a first step, the subgroup recommends that the CIO Council endorse the framework on two fronts: for developing and maintaining a Federal architecture, and as a “Best Practice” encouraging Federal organizations to use the framework for development and maintenance of their architectures. For this framework to be successfully implemented on a Federal scale, the architecture segments of Federal organizations (where applicable) must be able to relate to the Federal architecture segments. This goal requires that the architectures of Federal organizations have components (like architecture segments) that translate into similar components for the Federal architecture. Federal organizations in the early phases of developing an architecture framework, should embrace this framework, because it is generic enough to handle the needs of Federal organizations, while at the same time ensuring relatable components with the Federal architecture.

Encourage use of the Terminology of the Framework - The key for achieving a working relationship between Federal architects is a common set of architecture concepts and architecture terms. This framework provides both the concepts and the terminology. In order to successfully implement this Federal framework, the subgroup recommends that the CIO Council become familiar with the basic terminology of this framework, and use the terminology in all IT processes.

Incorporate Architecture Processes into CIO Council Activities - The subgroup recommends that the CIO Council incorporate the processes of the framework into CIO Council committee processes. The components of the framework can relate directly to the committees of the CIO Council. The processes of the committees should be the processes defined in the framework.

Establish a Federal Architecture Group - Developing and maintaining a Federal architecture is a process which requires continuous management. The subgroup recommends that the CIO Council acquire a few full time positions to staff critical management processes which cannot be managed by committees. Examples of critical processes include maintaining the vertical architectures (eg. the current and target architectures), maintaining the horizontal architectures (eg. the four sub-architectures of the current and target architecture), and ensuring consistency between the vertical and horizontal architectures.

Inventory and Categorize existing Federal Architecture Segments - Though they may not call themselves “Federal architecture segments”, many Federal cross cutting initiatives are currently under development. The end products of these initiatives have architecture implications. The subgroup recommends that the CIO Council develop an inventory of these Federal architecture segments to: 1) identify and coordinate architecture segment activities, 2) establish lines of communications between these Federal architecture segment activities and similar activities of Federal organizations, and 3) ensure adherence of Federal architecture segments to the overall Federal architecture.

Develop Federal Architecture Segment Management Processes - The subgroup recommends that the CIO Council develop processes for managing the various Federal architecture segments. Examples of these processes include 1) developing a process for prioritizing existing Federal architecture segment development, 2) developing a process for adding proposed new Federal architecture segments to be developed, 3) developing a process for working with Federal organizations on developing Federal architecture segments, and 4) developing a process for communicating progress and decisions on Federal architecture segments development/maintenance to Federal organizations and all interested partners. A successful Federal architecture segment management process will encourage and facilitate the sharing of resources between Federal organizations, thereby minimizing the duplication of efforts.

Establish a Federal Investment Review Group/Process - The subgroup recommends that the CIO Council establish a Federal Investment Review Group for reviewing Federal architecture segment proposals to ensure alignment with the Federal architecture. This review group would have collective muscle in the marketplace and could potentially influence development of government technologies, and could negotiate purchase agreements with economies of scale. Potentially, this group could survey Federal organizations on a periodic basis to gauge buy-in to CIO Council guidelines.

Use the Framework to Organize Architecture Information - The framework represents an empty shell with “place-holders” for information. The subgroup recommends that the CIO Council use the framework to organize and present information. One potential candidate for this use would be the CIO Council web page. All Federal architecture activities could be accessed from relevant parts of the framework. In other words, the framework could function as a site-map.

Develop a Plan for Populating the Components of the Framework - The subgroup recommends that the CIO Council develop a plan for populating the framework with Federal architecture information². The plan should prioritize the components (or parts of components), that will yield the greatest reward, to be tackled first.

Recommendations to Federal Organizations

² Note: This subgroup is currently populating the Vision and the Principles components of the framework, to be published under separate cover.

Adopt this conceptual framework in your Federal organization - For Federal organizations that have not yet developed an architecture conceptual framework, the subgroup recommends that these organizations adopt this framework, and modify as needed. This framework was designed with the flexibility to accommodate the architectures of Federal organizations, and by modifying this framework rather than creating a new one, organizations can capitalize on already expended time, resources, and costs, used for this Federal framework. The subgroup recognizes that some Federal organizations already have architecture frameworks in place, and that other organizations will prefer to develop their own frameworks. For these cases, the subgroup recommends, as much as possible, mirroring the concepts and terminology used in this Federal framework, to enable communication between Federal organizations when collaborating on segment architecture efforts of the Federal architecture and organizational architectures.

Participate in the Architecture Workgroups of the Interoperability Committee - The subgroup recommends that Federal organization's participate in the CIO Council's Interoperability Committee architecture workgroups to populate the Federal framework, and to collaborate on the development Federal architecture segments. Federal organizations can benefit from populating the Federal framework, because they can share resources for a cost effective end-product resulting from combined knowledge bases, Federal architecture segment information can serve as a starting point for populating organizational architecture information, and collaborating at the Federal level allows for better connectivity between the Federal architecture and the architectures of Federal organizations.

APPENDIX A: ARCHITECTURE TERMS AND DEFINITIONS

Architecture Drivers

- Is a component of the Federal enterprise architecture conceptual framework
- Consists of two sub-components: business drivers and technology drivers
- Represents external forces which cause the enterprise architecture to change

Architecture Segments

- Is a component of the Federal enterprise architecture conceptual framework
- Consists of various continually changing Federal architecture initiatives
- Represents a vertical slice of the current and target architectures
- Uses the sub-architecture models to define the content of the current and target architectures
- Identifies Federal architecture initiatives with potential for Federal architecture collaboration
- Is a standalone Federal architecture development effort which focuses on a narrowly scoped portion of the Federal target architecture
- Must be integrated into the Target Architecture prior to implementation
- Can be used to achieve economies of scale through resource sharing
- Examples might include:
 - Central Receiving Architecture
 - Email Architecture
 - Administrative Systems Architecture

Business Architecture

- Is a component of the current architecture and the target architecture
- Contains the content of the business models
- Focuses on the Federal business areas and processes responding to a business driver
- Relates to the Federal mission and goals
- Defines the Federal business processes and the Federal information flows and information needed to perform business functions
- Is used to classify and organize business level information

Business Drivers

- Is a component of the architecture drivers
- Are change agents which cause the enterprise architecture to change
- Represent emerging business needs

Business Models

- Is a component of the sub-architecture models
- Are used for defining the business needs, business processes, and business information
- Are models used for representing the current and target Federal business architecture

Certification Process

- Process for evaluating the level of compliance of proposed new systems and proposed enhancements to current systems
- Process for certifying alignment with the Federal architecture

Conventional Architecture Approach

- An architecture methodology
- Requires the completion of full blown architecture before strategic changes can be applied, and strategic rewards collected

Current Architecture

- Is a component of the Federal enterprise architecture conceptual framework
- Contains the content of the sub-architecture models
- Represents the cumulative “as-is” or “baseline” existing Federal architecture

Data Architecture

- Is a component of the technology architecture
- Contains the content of the data models
- Focuses on multimedia data
- Defines the Federal data model and the Federal meta data repository
- Is used to standardize data for sharing across Federal systems
- Is used to define Federal system and infrastructure requirements

Data Models

- Is a component of the technology models
- Focuses on multimedia data
- Are used for defining the data model and the meta data repository
- Are models used for representing the current and target Federal data architecture

Enterprise Architecture

- Is a *strategic information* asset base
- Focuses on *common Federal-level* architecture issues, and
- Defines the *business* of the Federal Government,
- the *information* necessary to operate the business,
- the *technologies* necessary to support the business operations, and
- the *transitional processes* used to implement new technologies in response to the changing needs of the business.

Goals & Objectives

- Is a part of the strategic direction
- Describes opportunities to accomplish the Vision

Horizontal Architectures

- Represents a horizontal view of an architecture segment
- Corresponds to the layers of the current and target architectures: the business architecture, the data architecture, the system architecture, and the infrastructure architecture

Infrastructure Architecture

- Is a component of the technology architecture
- Contains the content of the infrastructure models
- Defines the parts of the Federal communication network and their interaction and interdependence
- Is used to standardize communication protocols between Federal locations to enable shared communication

Infrastructure Models

- Is a component of the technology models
- Are used for defining the components of the Federal communication network and their interaction and interdependence
- Are used to standardize communication protocols between Federal locations to enable shared communication
- Are models used for representing the current and target Federal infrastructure architecture

Multimedia Data

- Is data which is stored in various formats
- Examples include: voice, text, images, video, etc.

Principles

- Is a part of the strategic direction
- Are statements which: provide strategic direction to support the Federal vision, guide decision making, withstand the test of time, and are not prescriptive

Segment Architecture Approach

- Is an architecture methodology
- Promotes the incremental development of architecture segments within a structured enterprise architecture framework, allowing for quicker rewards

Standards

- Is a component of the Federal enterprise architecture conceptual framework
- Is a set of criteria/guidance which promotes interoperability
- Can be defined for the various components of the current and target architectures
- Includes mandatory standards, voluntary guidelines, and best practices
- Examples include:
 - Federal Data Standards and Profiles
 - Federal System Standards and Profiles

- Federal Infrastructure Standards and Profiles
- Federal Security Standards and Profiles
- Federal Interface Standards

Strategic Direction

- Is a component of the Federal enterprise architecture conceptual framework
- Defines the vision, goals and objectives, and principles
- Maintains consistency with Federal direction (as stated in documents such as the NPR, the Blair House Papers, and the CIO Council Strategic Plan)
- Maintains consistency with Federal strategic direction
- Defines the motivation for developing an Federal architecture
- Guides the development of the Federal architecture
- Responds to architecture drivers such as changing business needs and emerging Technologies

Sub-Architectures

- Are lower level architectures under the current and target architectures

Sub-Architecture Models

- Is a component of the Federal enterprise architecture conceptual framework
- Consists of two sub-components: business models and technology models
- Are used to guide the development of the current architecture and the target architecture
- Represents a general model, or taxonomy, for architecture development, does not contain any architecture information, all architecture information resides in the current architecture or the target architecture

Systems Architecture

- Is a component of the technology architecture
- Focuses on Federal application systems and interfaces
- Contains the content of the systems models
- Identifies and defines the Federal enterprise systems and their interfaces (Systems Inventory)
- Identifies and defines relationships between Federal application systems and: Federal business processes, Federal systems data, and the Federal infrastructure
- Is used to support IT investment planning
- Is used to define Federal infrastructure requirements

Systems Models

- Is a component of the technology models
- Are used for defining the Federal enterprise systems and their interfaces
- Are models used for representing the current and target Federal systems architecture

Target Architecture

- Is a component of the Federal enterprise architecture conceptual framework
- Contains the content of the sub-architecture models

- Represents a future target for the Federal architecture
- Aims to move the current Federal architecture closer to the Federal architecture vision and strategic direction
- Responds to Federal architecture drivers such as changing business needs, or emerging technologies
- Uses the architecture standards to facilitate the migration from the current architecture to the target architecture

Technology Architecture

- Is a component of the sub-architecture models
- Consists of three sub-components: data architecture, systems architecture, and infrastructure architecture
- Focuses on the Federal data, systems, and infrastructure required to support the business needs

Technology Drivers

- Is a component of the architecture drivers
- Are change agents which cause the enterprise architecture to change
- Represent emerging technologies offering new solutions for business needs

Transitional Processes

- Is a component of the Federal enterprise architecture conceptual framework
- Defines all processes for evolving the target architecture from the current architecture
- Answers migration questions such as “who”, “how”, and “when”
- Examples include:
 - A Legacy Systems Integration Plan/Process used for interfacing new systems with legacy systems
 - A Migration Plan/Process used for prioritizing, coordinating, and managing the migration of Federal Architecture Segments from the Current Architecture to the Target Architecture
 - A Technology Evaluation Plan/Process used for evaluating potential new Federal technologies
 - A Capital Planning Investment Review Plan/Process used to ensure consistency and compliance with the Federal IT architecture, and to review and prioritize investments in architecture segments
 - An IT Architecture Certification and Waiver Plan/Process used for managing compliance and exceptions to the enterprise architecture
 - A Communication Plan/Process used for disseminating Federal enterprise architecture information to the all customers
 - A Training Plan/Process used for evaluating and providing continuous IT training to Federal employees
 - An IT Personnel Plan/Process used for attracting and keeping valuable IT professionals in Federal service to successfully implement and support the enterprise architecture

Vision

- Is a part of the strategic direction
- Provides strategic direction to the enterprise architecture
- Looks five years out
- Defines, in broad terms, how Federal will use information in the future
- Is used to guide resource decisions, to reduce costs, and improve mission performance

Vertical Architectures

- Vertical view of an architecture segments
- Contains current architecture information and the target architecture information

APPENDIX B: SUBGROUP PARTICIPANTS

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